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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
VAN DOREN, BETH	
ART UNIT	**PAPER NUMBER**
3623	

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/072,971	HARRIS, JOHN M.
	Examiner	**Art Unit**
	Beth Van Doren	3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/31/2006 has been entered.

2. Claims 1, 5, 7, 9, and 11 have been amended in the currently entered communications. Claims 1-5 and 7-14 are now pending in this application.

Response to Amendment

3. Applicant's amendments to claim 7 are sufficient to overcome the 35 USC § 112, second paragraph, rejections and the 35 USC § 101 rejections set forth in the previous office action.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5, 7, and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erke et al. (U.S. 2003/0061126) in view of Wetzer (U.S. 6,738,748).

As per claim 1, Erke et al. teaches a method of determining a time interval at which unscheduled demand for the components is expected to occur, the method comprising:

establishing a plurality of statistical models for a probability of unscheduled component demand as a function of time and a failure rate of a component, wherein each of the plurality of statistical models includes a linear combination of variables pertaining to component use (See paragraphs 0017, 0041-4, 0076, 0078-9, wherein statistical models are established by the computer wherein the user enters data and the computer builds and implements the model. See paragraphs 0026, 0029-32, wherein the probability of unscheduled component demand is considered in the models using the parameters of time and a failure rate of a component);

for each component, collecting historical unscheduled component demand data (See paragraphs 0016-7, 0026, 0029, 0031 wherein data concerning fill rates for demand is collected);

for each component, using the collected historical unscheduled component demand data to select one statistical model from the plurality of statistical models, wherein the selected model most closely matches the historical unscheduled component demand data (See paragraphs 0017, 0041-4, 0076, 0078-9, wherein statistical models are established by the computer wherein the user enters data and the computer builds and implements the model. The model is fit to the specific data concerning the problem such that it represents the specific variables and circumstances of the situation at hand);

for each component, selecting an allowable probability of underestimating an average failure rate, α (See paragraphs 0026 and 0029-0031, wherein the probability of having to few parts in inventory to meet failure demand is set forth); and

using the selected statistical model to calculate inventory levels to meet unscheduled component demand (i.e. demand based on parts failure) (See figure 3, paragraphs 0017, 0026, 0041-3).

However, Erke et al. does not expressly disclose and Wetzer discloses calculating a time interval at which the unscheduled component demand is expected to occur (See column 2, lines 17-28, column 5, lines 33-47, column 7, lines 1-20, column 10, lines 1-30 and 40-column 11, lines 21 and 30-40, and column 14, lines 66-67, wherein the probability predictions of demand are used to determine and schedule for unplanned failure needs).

Both Erke et al. and Wetzer disclose monitoring the use of components to provide data concerning failure and wear-out of components to indicate demand for additional components. Erke et al. discloses computer based optimization which takes into account data such as request rates based on failure, time, parts procurement time performance metrics, fill rate probabilities, etc. to obtain needed and optimized component inventory levels. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the optimization model output a time period when the unscheduled component demand is expected to occur in order to more efficiently optimize customer part procurement times by more accurately identifying when stock of components is needed to meet demand. See paragraphs 0013-5, 0033, 0039, which discuss the importance of timely parts procurement.

As per claim 2, Erke et al. discloses using statistical models (See paragraphs 0017 and 0041-3) and selecting an allowable probability of underestimating an average failure rate, α (See paragraphs 0026 and 0029-0031, wherein the probability of having to few parts in inventory to meet failure demand is set forth).

However, Erke et al. does not expressly disclose and Wetzer teaches calculating a time interval when a probability of the next unscheduled component demand event equals the probability that the unscheduled component demand will not exceed the allowable probability ($1-\alpha$) (See column 2, lines 17-28, column 10, lines 1-30 and 40-column 11, lines 21 and 30-40, and column 14, lines 45-67, wherein an allowable probability of failure is considered and accounted for in the system. If the probability of failure is α, then the allowable probability (the probability for which the component will not fail) is $1-\alpha$ as per statistics).

Both Erke et al. and Wetzer disclose monitoring the use of components to provide data concerning failure and wear-out of components to indicate demand for additional components. Erke et al. discloses computer based optimization which takes into account data such as request rates based on failure, time, parts procurement time performance metrics, fill rate probabilities, etc. to obtain needed and optimized component inventory levels. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the optimization model output a time period when the unscheduled component demand is expected to occur in order to more efficiently optimize customer part procurement times by more accurately identifying when stock of components is needed to meet demand. See paragraphs 0013-5, 0033, 0039, which discuss the importance of timely parts procurement.

As per claim 3, Erke et al. teaches wherein each statistical model comprises a Poisson distribution having a parameter λ (See paragraphs 0076-9, which disclose a Poisson distribution with a parameter λ).

As per claim 4, Erke et al. teaches wherein selecting the statistical model comprises selecting an equation for λ (See paragraphs 0043-4, 0065, 0072-9).

As per claim 5, Erke et al. teaches established models using unscheduled demand to predict components needs and failure rates (See paragraphs 0017, 0041-4, 0076, 0078-9, wherein statistical models are established by the computer wherein the user enters data and the computer builds and implements the model. See paragraphs 0026, 0029-32, wherein the probability of unscheduled component demand is considered in the models using the parameters of time and a failure rate (i.e. fill rate based on need due to failure) of a component). However, neither Erke et al. nor Wetzer expressly discloses eliminating insignificant variables and variables that cause multicollinearity from each of the established models using historical unscheduled demand.

It is well known in statistics to detect and remove variables that are found to be insignificant or cause multicollinearity in models. The claims do not provide the specific models or variables and provide no specific process or reason for the removal of the variables, just that the removal occurs. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to remove variables that are insignificant and variables that cause multicollinearity in order to decrease the likelihood of errors in the model by removing the variables that statistically cause these errors to occur. This benefit is well known in the art of statistics.

As per claim 7, Erke et al. teaches a computer software encoded with a program for forecasting unscheduled demand for a plurality of different components, the program when executed performing the steps of:

establishing a plurality of statistical models for modeling unscheduled demand for the components as a function of a failure rate of each of the components, wherein each of the plurality of statistical models includes a linear combination of variables pertaining to component

use (See paragraphs 0017, 0041-4, 0076, 0078-9, wherein statistical models are established by the computer wherein the user enters data and the computer builds and implements the model. See paragraphs 0026, 0029-32, wherein the probability of unscheduled component demand is considered in the models using the parameters of time and a failure rate of a component);

for each component, collecting historical unscheduled component demand data (See paragraphs 0016-7, 0026, 0029, 0031 wherein data concerning fill rates for demand is collected);

for each component, selecting one of the statistical models of the plurality of statistical models for a probability of unscheduled component demand, wherein the selected statistical model most closely matches the historical unscheduled demand data corresponding to the component (See paragraphs 0017, 0041-4, 0076, 0078-9, wherein statistical models are established by the computer wherein the user enters data and the computer builds and implements the model. The model is fit to the specific data concerning the problem such that it represents the specific variables and circumstances of the situation at hand); and

using the selected statistical model to calculate inventory levels to meet unscheduled component demand (i.e. demand based on parts failure) (See figure 3, paragraphs 0017, 0026, 0041-3).

However, Erke et al. does not expressly disclose and Wetzer discloses determining a date at which a cumulative probability of unscheduled component demand reaches a predetermined threshold (See column 2, lines 17-28, column 5, lines 33-47, column 7, lines 1-20, column 10, line 35-column 11, line 21, which discusses threshold values for the probability of failure).

Both Erke et al. and Wetzer disclose monitoring the use of components to provide data concerning failure and wear-out of components to indicate demand for additional components.

Erke et al. discloses computer based optimization which takes into account data such as request rates based on failure, time, parts procurement time performance metrics, fill rate probabilities, etc. to obtain needed and optimized component inventory levels. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the optimization model determine when a cumulative probability of unscheduled component demand reaches a predetermined threshold, associated with a date, in order to more efficiently optimize customer part procurement times by more accurately identifying when stock of components is needed to meet demand. See paragraphs 0013-5, 0033, 0039, which discuss the importance of timely parts procurement.

Claims 10 and 11 recite equivalent limitations to claims 3 and 4, respectively, and are therefore rejected using the same art and rationale set forth above.

As per claim 12, Erke et al. teaches wherein the failure rate of the component is a function of operation (See paragraph 0026, which disclose wear out based on operation). However, Erke et al. does not expressly disclose that the failure rate of a component is the function of temperature.

Wetzer et al. teaches wherein the failure rate of the component is a function of the use of the component and environmental factors related to the component (See column 4, lines 45-65, column 5, lines 33-47, column 6, lines 55-67, column 8, lines 22-35, and column 10, lines 1-30, wherein the failure rate is based on usage). However, Wetzer does not expressly disclose temperature as usage.

Both Erke et al. and Wetzer disclose monitoring the use of components to provide data concerning failure and wear-out of components to indicate demand for additional components.

Wetzer discloses monitoring the use of components to provide data such as longevity, environmental factors, use profiles, and operating limits, this data indicative of when maintenance and failure of the component will occur. It is old and well known in mechanics that parts have specific temperature ranges in which they are supposed to operate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to consider the failure rate as a function of temperature and include this in the system of Erke et al. in order to more accurately plan for failure and maintenance, thus reducing the downtime of equipment that causes a reduction in revenue. See column 1, lines 50-65, column 11, lines 1-10, and column 14, lines 40-67, all of which equate better planning to money.

As per claims 13 and 14, Erke et al. teaches wherein the failure rate of the component is a function of operation (See paragraph 0026, which disclose wear out based on operation). However, Erke et al. does not expressly disclose and Wetzer teaches wherein the failure rate of the component is a function of hours of operation (See column 4, lines 45-65, column 5, lines 33-47, column 8, lines 22-35, and column 10, lines 1-30, wherein the failure rate is based on the hours a component operates) and wherein the failure rate of the component is a function of flight cycles (See column 4, lines 45-65, column 5, lines 33-47, column 6, lines 55-67, column 8, lines 22-35, and column 10, lines 1-30, wherein the failure rate is based on flight cycles).

Both Erke et al. and Wetzer disclose monitoring the use of components to provide data concerning failure and wear-out of components to indicate demand for additional components. Erke et al. discloses computer based optimization which takes into account data such as request rates based on failure (i.e. wear out), time, parts procurement time performance metrics, fill rate probabilities, etc. to obtain needed and optimized component inventory levels. Therefore, it

would have been obvious to one of ordinary skill in the art at the time of the invention to have the optimization model include the failure of wear out based on the hours of operation of the component in order to more efficiently optimize customer part procurement times by more accurately identifying when stock of components is needed to meet demand. See paragraphs 0013-5, 0026, 0033, 0039, which discuss the importance of timely parts procurement.

6. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erke et al. (U.S. 2003/0061126) and Wetzer (U.S. 6,738,748) in further view of Hillier et al. (*Introduction to Operations Research*).

As per claims 8 and 9, Erke et al. teaches established models using unscheduled demand to predict components needs and failure rates (See paragraphs 0017, 0041-4, 0076, 0078-9, wherein statistical models are established by the computer wherein the user enters data and the computer builds and implements the model. See paragraphs 0026, 0029-32, wherein the probability of unscheduled component demand is considered in the models using the parameters of time and a failure rate (i.e. fill rate based on need due to failure) of a component). However, Erke et al. does not expressly disclose using as N-Erlang distribution or selecting an equation for λ in the N-Erlang distribution.

Wetzer discloses modeling for failure rate and unplanned component demand (See column 4, lines 45-65, column 5, lines 33-47, column 6, line 50-column 7, line 20, column 10, line 35-column 11, line 21, column 14, lines 49-67). However, Wetzer et al. does not expressly disclose using as N-Erlang distribution or selecting an equation for λ.

Hillier et al. discloses using an Erlang distribution to model the expected number of demand events occurring at a time in the furture (See pages 698-700 and 916-7, which discuss using the Erlang distribution in association with queuing theory).

The Erlang (or N-Erlang) distribution is a well-known statistical distribution used in queuing theory to model the number of events expected to arrive or occur at a specific time period, as discussed by Hillier et al. Both Erke et al. and Wetzer disclose monitoring the use of components to provide data concerning failure and wear-out of components to indicate demand for additional components. Erke et al. specifically discloses using statistical models with linear variables. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the claimed N-Erlang distribution as the model in order to more efficiently optimize customer part procurement times by more accurately identifying when stock of components is needed to meet demand. See paragraphs 0013-5, 0033, 0039, which discuss the importance of timely parts procurement.

Response to Arguments

7. Applicant's arguments with regards to the 35 U.S.C. § 103 rejections over Erke et al. (U.S. 2003/0061126) in view of Wetzer (U.S. 6,738,748) and with regards to the 35 U.S.C. § 103 rejections over Erke et al. in view of Wetzer and in further view of Hillier et al. (*Introduction to Operations Research*) have been fully considered, but they are not persuasive. In the remarks, applicant argues that Erke et al. and Wetzer do not teach or suggest the first three limitations of claims 1 and 7 and that Hillier et al. in claims 8 and 9 fails to remedy the deficiencies found with regards to claim 7.

In response to this argument, Examiner respectfully disagrees. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Applicant presents the first three limitations of claims 1 and 7 verbatim and then assets that the prior art does not teach these limitations. Applicant therefore does not specifically point out how the language of the claims (i.e. specific terms and limitations) patentably distinguishes from the references. Further in claim 8 and 9, Applicant states that the rejections are traversed since Hillier et al. fails to cure the deficiencies of Erke et al. and Wetzer, but again does not specifically discuss deficiencies with Hillier et al. and how the language of claims 8 and 9 patentably distinguishes them from the references. Therefore, the arguments are not found to be persuasive and Examiner maintains the rejections set forth above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Beth Van Doren whose telephone number is (571) 272-6737. The examiner can normally be reached on M-F, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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